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PROBLEMS OF HUNGARIAN PLASTICS INDUSTRY, AND EFFORTS FOR IMPROVEMENT

Lorand Borsodi

A resolution of the Council of Ministers of Hungary on material conservation provides for an increase in the utilization of synthetic plastic materials. This makes imperative the solution of the problems of the plastic-processing industry.

Following completion of a survey of the plastic-processing industry, the Material Conservation Economy Bureau called a meeting of the workers of the industry, which at present functions under four ministries and five industrial departments. At the meeting it was revealed that many shortcomings of the plastics industry arise from the fact that plastic-processing plants operate in isolation from one another, resulting in haphazard utilization of machines and presses, irregularities in specific production, disorganized range of products, etc. The aim and task of the meeting was the termination of these faults and discussion of technical and organizational questions.

First Lecture

The first lecture at the meeting presented the picture of the current state of the plastics industry, especially of the plastic materials and processing industries, the available machines, the processing of synthetic molding powders, and the high level of spoilage.

The speaker stated that approximately 60 percent of the presses of the plastic-processing industry are hand operated, and that nonproductive work hours of the machines, due to machine repair and change, total approximately 30 percent. The average spoilage - and consequently, production costs - is very high. Spoilage can and should be reduced through the introduction of proper machines and modern manufacturing methods.

These problems and the organization of the plastics industry were discussed as follows:

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Zoltan Tamas

Zoltan Tumas, mechanical engineer, have a talk on "Material Qualities in the Plastics Industry," in which he pointed out faults which tend to give plastics a property similar to metal or porcelain. Tamas suggested that presses which are used in the manufacture of metal and porcelain may also be used to manufacture plastic products. He gave several examples of the difficulties, as follows:

In the manufacture of a tool handle, the compressed material absorbed water, making it easy to break. This was not a fault of the plastic material, but was due to irregular resistance to the flow of molding powder in the die along the ribbing of the handle. The resistance was excessively high in some places, causing lack of homogeneity in the material, and in other places it dropped to a minimum. These faults are not apparent to the naked eye, and are detected only through use.

The high cost of plastics machines causes workers to hesitate to evaluate defects correctly when having machines repaired, or to order new parts, when needed. If these faulty practices are remedied, the improvement in the quality of finished products and reduction in the quantity of raw material consumed will permit the cost of the new investments to be recovered several times.

Zsigmond Haar

Zsigmond Haar spoke on the principles of design of machines used in mass production, and the multiple utilization and future standardization of plastic production implements. Among his remarks were the following: Some of the most serious problems of the plastics industry are: the relatively high cost of production implements, the fact that the design of plastics machines is different from ordinary machines, and the disorderly state of the reserve of plastic machines before socialization of the industry.

To convert plastic processing into a large-scale industry will require the orderly grouping of machines, the standardization of machines, and the introduction of machines based on a standard design. The precision of machines now in use depends on the skill of the individual machine builder. These machines should be replaced by the new standardized machines.

Standardized machine operations and interchangeable press platens will reduce production and maintenance costs and will provide versatility suitable for various types of production methods. Press platens may be standardized in one piece, the standard frame, to which dies may be attached. Thus, any unit frame may be used without additional adaptation in all plastic-producing plants in the country, as is already the practice with ball bearings. The national standard could be based on the system in operation at the only plastic-processing factory in the country equipped with planned tooling, the Kabel Factory. Important factors in the design of standard frames are simplicity, precision, and strength.

Advantages of the standard frame are that a single investment provides an instrument for pressing many kinds of articles, and repeated heating of the instrument is unnecessary. Articles of approximately the same size and requiring similar manufacturing techniques can be produced on one frame unit. Small articles may be manufactured on large machines through the use of transformer rings.

Recognition and solution of the problems of plastic tools, however, will not solve the problems of the plastic-processing industry.

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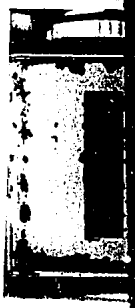

Istvan Ujfalussy

Istvan Ujfalussy, quality control director of the Kobanya Synthetics Factory, reported the following faults in pressing plastics:

The various types of plastic powders are not adapted properly to the type of article manufactured. Harder grains, higher temperatures, higher pressures and shorter baking time should be used primarily for articles with large surfaces; hard-grain powders also produce a glossier surface; and for complex articles, a more easily flowing powder should be used, with less pressure and longer baking time. However, insufficiently baked plastics break easily, and have low electrical resistance. Determining the internal consistency of a baked item by testing its electrical resistance is more advantageous than testing by perforation or testing a cross section by breaking.

Spoilage in the plastics industry is excessively high. Improper baking may give rise to many difficulties, including gas bubbles in the finished product, lack of sufficient strength, deformation, and low electrical resistance. The proper temperature for baking aminoplasts is 150 degrees centigrade, plus or minus 2-2.5 degrees.

Surface defects arise from poor shop practices. They include; light- and dark-colored items being manufactured on adjacent presses; while cleaning the presses with compressed air, permitting dust or other plastic powders to be blown into the press forms; failure to clean a press thoroughly when changing production to a different colored item; and interpollution of plastic powders due to improper storing. A leathery surface may result from moisture in Doramin powder which, although not a serious fault, makes the product unacceptable for export. Agglutination of plastic powders hinders processing.

Janos Kertesz

Another problem of the plastic-processing industry, the preheating of plastic powders, was discussed by Chief Engineer Janos Kertesz. He noted that:

A cold powder coming in contact with the press form which has been heated to 145-180 degrees centigrade results in a product with a hard shell and an unbaked, unpolymerized core. The problem of preheating plastic powders has been solved by the manufacture of high-frequency preheating apparatus. The apparatus in use generally operates at 100 watts and heats 100 grams of powder to approximately 100 degrees centigrade in 2.5 minutes. High-frequency preheating is very simple, but the relatively expensive apparatus requires technically precise and careful handling. A 1.5 kilowatt high-frequency apparatus can preheat charges of from only a few grams up to 540 grams of plastic material. When possible, the plastic material is used in tablet form. The tablets are placed in the high-frequency preheater in a circular pattern, to utilize the greatest electrode surface.

The high-frequency preheating apparatus is regulated by anode voltage, which is controllable on the commonly used types. Preheating time is reduced at higher voltages, but preheating is begun with less than 5 kilovolts to insure constant and even production.

With the proper installation, a high-frequency preheating apparatus can serve several presses.

Baking time is reduced to a minimum by preheating the plastic material to a constant temperature. When the plastic material is thoroughly preheated, its viscosity is considerably reduced, permitting greater exploitation of presses and tools.

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Resolutions Adopted

Following debate on the previous lectures, the convention adopted the following three resolutions, which have already been put into effect in the plastics industry:

1. For rationalization of 1951 production of the plastic-processing industry: the Organic Chemistry, High Voltage, Communications Technology, and Mass Production Departments of the Ministry of Metallurgy and Machine Industry should submit to the Plan Office a joint resolution on further rationalization of the plastic-processing industry. The aim of further rationalization is to centralize as much as possible the production of similar items, to reduce machine stoppage resulting from tool changing, to reduce spoilage, increase productivity, and improve the quality of production.

The departments mentioned above should examine the production list and make suggestions for reducing the number of products.

2. A Plastic-Tool Plan Examining Committee should be formed as a temporary expedient to break the present bottleneck in designing plastic tools and to improve the quality of tool designs. Designs for plastic tools are to be submitted to the tool-plan examining committee for comment and approval before the design is executed.

3. For broadening the technical training of workers, all shops of the plastic-processing industry will provide for worker training. Shop foremen are to be responsible for organizing the training of the workers.

The starting date of the training program is to be 1 March 1951. The minimum instruction period should be one hour per week. One of the important subjects of the instruction is to be a lecture on qualities of molding powders plus pertinent comments and the debate heard at the congress. The Material Conservation Economy Bureau will be responsible for reproducing the contents of the lecture, distributing it to the shops for instruction purposes, and for organizing a corps of lecturers. The Material Conservation Economy Bureau entrusted the enterprises with organizing the group and training lectures have begun.

The resolutions of the meeting have been put into effect, and the Plastic-Tools Examining Committee has begun its work in the enterprises of the plastic-processing industry.

A decree of the Council of Ministers entrusted the Material Conservation Economy Bureau with national control of requisitions for raw material, the planning of raw material requisitions, and the rationalization of production items.

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